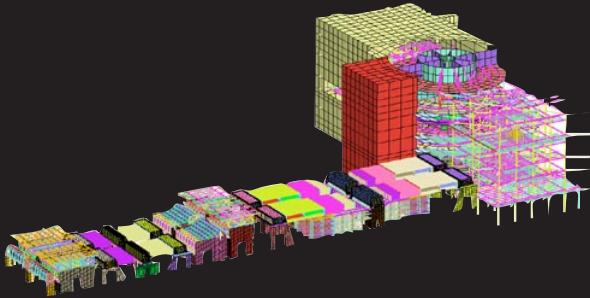


# Computer Simulations: Solve Critical Structural Problems

The Structural and Applied Mechanics Group (SAMG) applies its unique capabilities and expertise in many ways, including defense and nuclear technologies, seismic analysis and standards development, biomechanics, composites damage modeling, vehicle crash analysis, and structural dynamics and stress analysis of large, complex systems. Technologies developed for defense application are solving complex structural problems of interest to industry and government agencies.



Finite element models of the Target Area and Laser Component Supports Building are being used to evaluate optics stability due to ambient vibration, thermal, wind, and acoustic loads, and to assess seismic performance. This system is 525 feet long, 300 feet wide, and 100 feet tall.



## Defense Applications

Computer models are being used to evaluate response of weapons systems under hostile environments.

## Advance Earthquake Hazards Research

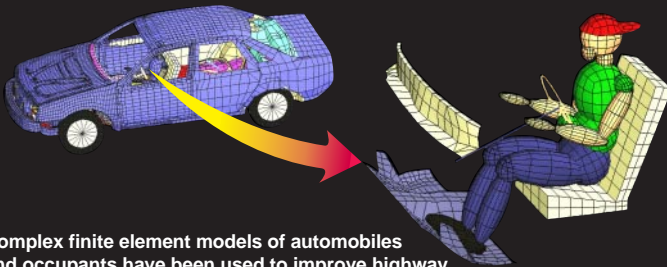


Computational model of the San Francisco-Oakland Bay Bridge western crossing.



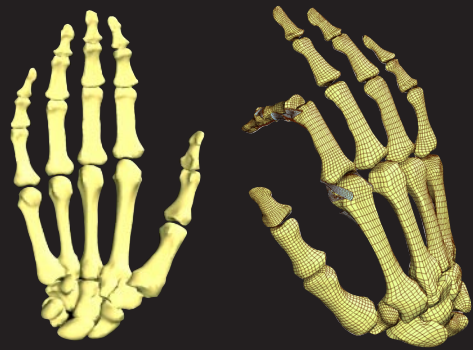
An LLNL/UC research team is studying the earthquake response of long-span bridges. Special computer software is being developed, which will allow efficient and accurate computer simulation of the response of large cable-supported bridges. This research will aid engineers in understanding the complex manner in which long bridges respond to earthquake shaking and how to design and retrofit these critical structures.

## Vehicle Impact Simulations



Complex finite element models of automobiles and occupants have been used to improve highway roadside safety features and to predict occupant injury during vehicle crashes.

## Biomechanics



Finite element model of human hand with articulating index finger. Models such as this are being used to study the effects of repetitive motion, acute injury, and degenerative diseases.